Claims

[c1] 1. A method for supplying reductant to a catalyst coupled to an internal combustion engine operating at a lean/air fuel ratio, comprising the steps of:

indicating a quantity of reductant stored within the catalyst; and

while said quantity is less than a first predetermined quantity, supply reductant to the catalyst.

[c2] 2. The method of claim 1, wherein said step of supplying reductant to the catalyst is performed under predetermined conditions.

[c3] 3. The method of claim 2, wherein an operating condition of the engine is selected to provide said predetermined conditions.

[c4] 4. The method of claim 2, wherein said predetermined conditions comprise a temperature of the catalyst greater than a predetermined temperature.

[c5] 5. The method of claim 4, wherein said predetermined temperature is approximately 300 degrees Celsius.

[c6] 6. The method of claim 2, wherein said predetermined conditions comprise a NOx concentration of an exhaust gas stream discharged from the engine less than a predetermined concentration.

[c7] 7. The method of claim 1, wherein said first predetermined quantity is an insignificant amount of reductant stored within the catalyst.

[c8] 8. The method of claim 1, further comprising the step that when said quantity of reductant stored within the catalyst is greater than a second predetermined quantity, substantially discontinue said supplying step.

[c9] 9. The method of claim 8, wherein said second predetermined quantity is based on an indication of a reductant storage capacity of the catalyst.

[c10] 10. The method of claim 2, wherein said predetermined conditions cause reductant to absorb onto active sites within the catalyst.

[c11] 11. The method of claim 10, wherein said active sites are comprised of copper

oxide.

[c12] 12. The method of claim 10, wherein said first predetermined quantity is an insignificant amount of reductant stored on active sites within the catalyst.

[c13] 13. The method of claim 12, further comprising the step of discontinuing said supplying step when said quantity of reductant stored on active sites within the catalyst is greater than a second predetermined quantity.

[c14] 14. The method of claim 10, further comprising the step of discontinuing said supplying step when said quantity of reductant stored on active sites within the catalyst is greater than a second predetermined quantity.

[c15] 15. The method of claim 14, wherein said second predetermined quantity is based on an indication of a number of active sites within the catalyst.

[c16] 16. A system for increasing the conversion of NOx in a catalyst receiving exhaust gases from a combustion chamber operating at an air/fuel ratio lean of stoichiometric, comprising:
an injector supplying reductant to the exhaust gases, said injector is located upstream of the catalyst; and
an electronic control unit operably connected to said injector and the combustion chamber which periodically creates a first set of operating conditions of said combustion chamber and actuates said injector during said first set of operating conditions.

[c17] 17. The system of claim 16, further comprising an exhaust gas sensor downstream of the catalyst.

[c18] 18. The system of claim 16, wherein said exhaust gas sensor is operably connected to said electronic control unit and said electronic control unit bases said actuation of said injector on a signal from said exhaust gas sensor.

[c19] 19. The system of claim 16, wherein said first set of operating conditions comprise creating a temperature in the catalyst greater than about 300 degrees Celsius.

[c20] 20. The system of claim 16 , wherein the combustion chamber is a combustion chamber of an internal combustion engine.

[c21] 21. A method for increasing NOx conversion efficiency of a catalyst coupled to an internal combustion engine, comprising the steps of:
providing an indication of a quantity of reductant stored within the catalyst;
when said quantity is less than a first predetermined quantity, creating an operating condition which provides a temperature in the catalyst exceeding a predetermined temperature.

[c22] 22. The method of claim 21 , wherein said predetermined temperature is approximately 300 degrees Celsius.

[c23] 23. A method for increasing NOx conversion efficiency of a catalyst coupled to an internal combustion engine, comprising the steps of:
providing an indication of a quantity of reductant stored within the catalyst;
when said quantity is less than a first predetermined quantity, creating an engine operating condition at which exhaust gases discharged from the engine have a concentration of NOx less than a predetermined concentration.

[c24] 24. The method of claim 23 , wherein said predetermined concentration is approximately 25 ppm.

[c25] 25. A computer readable storage medium having stored data representing instructions executable by a computer to control an internal combustion engine and an injector supplying reductant to the engine exhaust gases upstream of a catalyst coupled to the engine comprising:
instructions for periodically creating a first set of engine operating conditions; and
instructions for injecting reductant during said first set of engine operating conditions, wherein said first set of engine operating conditions are lean.

[c26] 26. The storage medium of claim 25 , further comprising:
instructions to determine a quantity of reductant absorbed on said surfaces of the catalyst; and
instructions for performing said creation of said first set of engine operating

conditions, when said quantity of reductant within said catalyst is less than a predetermined quantity of reductant.